Comparative levels of labour productivity and labour costs in manufacturing in Belgium and the Netherlands, 1921-1990

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1. Introduction

Belgium and the Netherlands share a lot of common characteristics in historical development, geographical location, political and institutional structure and in the size and the degree of openness of the economy. However, detailed comparisons of economic development of Belgium and the Netherlands have been largely neglected. General overviews of twentieth-century developments as presented by De Vries (1976), Van Rijckeghem (1982) and Blomme (1986) only compare growth rates for subperiods but do not touch upon relative levels of product and income per capita. In a recent overview of Belgian economic growth since the 1930s Cassiers, De Villé and Solar occasionally compare the economic performance of Belgium with the developments in the Netherlands (Cassiers et al., 1996). But so far, no systematic account has been taken of levels and growth rates of productivity.

One of the starting points for the present paper originates from an article by Cassiers and Solar (1990) on wages and productivity in Belgium between 1910 and 1960. In this article the authors present evidence on long-term changes in Belgian wages and labour productivity. According to their view Belgium changed in this period from a low wage economy into a high wage economy. However, developments in manufacturing labour productivity did not seem to have moved accordingly, which might explain the alleged poor performance of the manufacturing sector between 1930 and 1960. The authors show that still many gaps exist in the available evidence on twentieth-century productivity performance of Belgium. In fact the same holds true for the Netherlands. Several consistent estimates series on manufacturing productivity have been published for the periods 1913-1921, 1921-60 and 1960-1990 (De Jong and Albers, 1994; De Jong, 1993; Van Ark, 1993), but detailed level comparisons for the period before 1984 still lack.

In this paper we present a comparative description of the development of labour productivity in Belgian and Dutch manufacturing[2]. In section 2 we provide three comparative estimates of

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[2] Detailed calculations underlying all tables are published as a separate Research Memorandum: H.J. de Jong and A. Soete (1997), 'Comparative productivity and structural change in Belgian and Dutch manufacturing 1937-1987', Research Memorandum No. GD-36, Groningen Growth and Development Centre, Groningen.

productivity for the years 1937, 1960 and 1987, mainly based on census information. Levels of manufacturing productivity are extended backward and forward using time series based on production censuses and national accounts. This results (section 3) in a dynamic picture of productivity change from 1921 to 1990. To reconcile the samples from the census with total manufacturing we re-estimated the national accounts figures for the comparison-years. In section 4 we present evidence on structural shifts in the manufacturing sector. In section 5 cross-industry levels of relative labour costs and unit labour costs are given. This section also discusses the relation between comparative levels of wages and the comparative productivity levels for the post-1945 period.

2. Comparing the productivity estimates of 1937, 1960 and 1987

The procedure which has been used for the 1937 benchmark is based on the so-called 'industry-of-origin' approach, applied for the first time by Rostas (1948) in his Anglo-American comparison for the interwar period. We matched 25 industries and estimated productivity ratios using physical quantities of output and related employment. For the 1960 and 1987 benchmarks we used real indicators instead of physical indicators. This approach is based on the methodology proposed by for instance Paige and Bombach (1959). Price information, to convert output and productivity values into a common currency has been derived from unit value ratios. The latter procedure boils down to the construction of implicit purchasing power parities using the average prices of matched pairs of products from census information in order to get a systematic and transparent procedure for price comparisons, real output and productivity from one and the same source (see Maddison and Van Ark 1994).

For the year 1937 we made use of the Belgian Economic and Social Census of 1937 (Economische en Sociale Telling)and the Dutch census of production, the so-called Productiestatistiek. Additional data on production and employment were found in publications of the Belgian Federal Planning Bureau (Planning de la production industrielle Belge, 1949) and the Dutch Social Insurance Bank (Ongevallenstatistiek, 1937). The individual comparisons were aggregated by calculating a weighted average for whole manufacturing. We applied respectively Belgian and Dutch sectoral employment weigts and calculated finally the geometric average of both results. For 1960 and 1987 we made use of the production censuses in both countries. We calculated gross value added per worker at industry-level and converted the values into a common currency using specific unit value ratios derived from the censuses. Next, we aggregated industry-ratios into ratios at the level of major groups and for total manufacturing by applying value added weights of the industries within Belgian and Dutch manufacturing respectively. From these results we calculated the geometric average. Table 1 shows the productivity ratios at the level of major groups and for total manufacturing.

Table 1. Labour Productivity by Major Group in Manufacturing, Belgium and the Netherlands (Neth. =100), 1937, 1960 and 1987

Major group	1937	1960	1987
Food/Bev/Tob.	102	97	91
Text./Cloth.	97	93	73
Leather/shoes	102	76	65
Wood products		95	119
Paper & pr.	69	80	86
Chemicals	104	94	89
Building mat.	91	97	105
Metal	95	99	106
Tot.Manuf.	95.5	92.5	94.0

Note: for 1937 there was no matching information available for wood products; for aggregation purposes the level was set at 100.
Source: De Jong and Soete (1997)

Table 1 reveals that for the three benchmark years the comparative level of Belgian productivity fluctuates around 94 per cent of the Dutch level. However, there is no such stability to be found at the level of major groups. The Belgian relative productivity levels in food products, textiles, leather and chemicals show a sustained decline through time. Productivity levels in wood products, paper and printing, building materials and (primary) metal products have risen relative to the Dutch productivity levels.

Convergence of relative productivity levels can be measured by calculating the relative variance across industries over time or s-convergence (Barro and Sala-i-Martin, 1991). When using the figures in table 1 we necessarily get a very rough measure of relative variance, because productivity differences between industries tend to cancel out at the level of major groups. Therefore we measured also the relative variance of all the matched industries in the samples. The results are given in table 2.

Table 2. Relative Variance of Comparative Productivity Levels in Manufacturing, Belgium and the Netherlands, 1937, 1960 and 1987

	1937	1960	1987
Coefficient of variation in the sample	.276	.147	.266/.226
Coefficient of variation between major groups	.119	.088 (.078)	.145 (.095)

Notes: 1987 sample: the first ratio refers to a sample of the same industries as in the 1937 - sample,second ratio refers to a sample of the same industries as in the 1960-sample.
Relative variance measured at the major group level was calculated excluding wood products. Figures in parentheses refer to levels calculated when using the offical exchange rate.
Source: De Jong and Soete (1997)

The table shows a pattern of convergence between 1937 and 1960, when relative variation declined. But from 1960 to 1987 relative variation of all individual observations in the samples increased. At the level of major groups it increased as well. If we allow for exchange rate conversion (which tends to lessen the inter-industry dispersion in productivity levels) there is a significant decline in the coefficient of variation. Unfortunately it is not possible to calculate correlations between rates of productivity growth and relative productivity levels to measure b-convergence. But it is rather clear from tables 1 and 2, that extremely high and extremely low comparative levels of productivity persist, although in different sectors through time.

These three estimates on comparative productivity leave large gaps to be filled up. Movements of convergence or divergence between levels may have occurred in the periods between the benchmark years. For instance, what we cannot infer from the present tables is the often mentioned retardation of the Belgian manufacturing sector during the 1950s which is characterised by slow employment growth through efficiency-measures in traditional industries and at the same time low investment levels in 'new' industries (Lamfalussy, 104). It is still more difficult to see whether this development had its origins already in the thirties, as has been claimed by Hogg (1986) and Cassiers and Solar (1990, p. 442). In the Netherlands the 1950s are characterised by a sharp increase in employment and productivity in manufacturing. However, it has been claimed that the speed of productivity growth was so high because there was ample scope for catching-up, average production being at very low levels shortly after the war compared with the prewar period (Van Ark and De Jong 1996). Before we can draw conclusions on such matters we have to make the picture more dynamic.

3. Linking benchmarks to time series

Reconciling the levels and rates of labour productivity growth we combined the level-estimates for the three benchmark years with existing time series of comparative labour productivity. For the interwar period and the 1940s no official national accounts time series for manufacturing output and employment are available. We collected time series on manufacturing output and employment for Belgium from Soete (1994) and similarly for the Netherlands from De Jong (1993) for 1921-1960 and Van Ark (1993) for 1960-1990.

For the time series extrapolations we used the 1937 benchmark, from which we extended the comparison backward and forward. There are no benchmark estimates for the pre-1937 period to verify the accuracy of the backward extension. Graph 1 shows a long term level comparison of Belgian and Dutch manufacturing productivity. The Dutch 1937 level is put at 100 and the Belgian 1937 level at 95.5.

Here Graph 1

Contrary to what we found for the three benchmark estimates the long term comparison reveals that large productivity gaps prevailed during several periods. Especially in the 1930s, 1960s and 1970s there were considerable differences in productivity levels, Belgian levels being as low as 75 per cent of the Dutch levels. From the second half of the 1970s onward we can see convergence in levels.

The first question to be answered is how the extrapolated time series fit in with the actual benchmark estimates for 1960 and 1987. The 1960 comparative value according to the extrapolated time series shows a Belgian ratio of 87 per cent, which is about 5 percent points below our calculated benchmark ratio for total manufacturing based on value added weights. For 1987 our extrapolation results in a Belgian level of 99 per cent, which is 5 percent points above our actual benchmark-comparison estimate which was calculated at 94 per cent. However, we feel that the differences move well within limits of acceptance. There might be an influence resulting from traditional indexnumber problems which are related to measuring long term structural changes in manufacturing (Broadberry, 1993).

Now we have established a long term productivity comparison covering a time span of almost 70 years, we can take a closer look at the levels and rates of growth. Table 3 shows growth rates of labour productivity for different subperiods.

Table 3. Annual Compound Growth Rates of Labour Productivity in Manufacturing in Belgium and the Netherlands, 1921-1987

	Belgium	Netherlands
1921-1938	1.6	2.5
1938-1950	0.8	-0.6
1950-1973	4.3	6.2
1973-1987	4.6	2.7
1921-1950	1.3	1.1
1950-1987	4.4	4.5
1921-1987	3.0	3.0

Source: Belgium: Soete (1994), Netherlands: Van Ark and De Jong (1996)

As can be seen from table 3 manufacturing productivity in both countries increased in the period studied at exactly the same annual rate of 3.0 per cent. Moreover, graph 1 shows that the comparative levels of productivity performance in the beginning and end years (1921 and 1987) are very close too. However, if we look at levels and rates for subperiods we clearly see large differences in productivity growth.

In the interwar period the growth rate in the Netherlands was higher than in Belgium, resulting in a higher Dutch productivity level. For instance, in 1934 the Belgian level was at 75 per cent of the Dutch level. Indeed one could speak of a relative productivity 'failure' in Belgium. The choice of the reference years is rather crucial in estimating the productivity performance. Should we take 1937 instead of 1938 as the end year of the period, the Belgian growth rate would rise to 2.2 per cent and the Dutch rate to 2.6 per cent. However, during the 1930s and well into the Second World War average production was higher in the Netherlands.

In the period covering the war years productivity performance was low in both countries. From 1938 to 1950 productivity growth was even negative in the Netherlands. The Belgian growth rate is positive at 0.8 per cent, but if we again choose 1937 as the reference year (instead of 1938), there is hardly any productivity growth left (see also Cassiers et al., 1996, p. 202). The fall in productivity is also confirmed by contemporary reports on productivity growth which show low productivity levels for both countries compared with the prewar situation. In the Economic Survey of Europe (1949, p.6) the Belgian level for 1949 was estimated at 93 per cent of 1937, the Dutch at 81 per cent). Our picture for Belgium is also in line with the estimate of Vandermotten, who reports a negative growth rate of 1.8 annually between 1937 and 1947 (Vandermotten, 1980).

Between 1946 and 1950 both countries were at the same productivity level, but after 1952 productivity in the Netherlands increased much faster than in Belgium. For the period 1950-1973 the Dutch productivity growth rate was about 2 percent points higher than the Belgian rate, creating a large productivity gap between both countries. In 1974 Belgian productivity was a mere 75 per cent of Dutch productivity. However, after 1974 the productivity gap diminished quickly because of faster Belgian productivity growth at a rate of 2 percent points above the Dutch growth rate. In short, what we see here is a development of local divergence in the period of the 'golden age' followed by rapid convergence during the 1970s and 1980s.

A further step towards explanation of the specific productivity records of both countries can be taken by examining the components of productivity growth, namely growth of output and employment.

Table 4. Annual Compound Growth Rates of Real Value Added and Employment in Manufacturing, Belgium and the Netherlands, 1921-1987

	Real value added		Employment	
	Belgium	Netherlands	Belgium	Netherlands
1921-1938	2.7	4.8	1.1	2.3
1938-1950	1.6	2.0	0.8	2.6
1950-1973	5.0	6.9	0.7	0.7
1973-1987	1.6	0.9	-2.9	-1.7
1921-1987	3.1	4.3	0.0	1.2

Source: Belgium: Soete (1994), Netherlands 1921-1950: De Jong (1999), Netherlands 1950-1987: Van Ark (1993).

Table 4 shows for the total period a higher rate of output growth in the Netherlands. Differences in output growth were very large in the interwar years; this was caused mainly by the relatively poor performance of Belgium during the 1930s. From 1929 to 1938 output growth was negative at -1.4 per cent accompanied by a negative employment growth of -2.1 per cent. Productivity increase was realised through shedding labour (Cassiers, 1989, p.161). In Dutch manufacturing growth of output and employment both were positive for the period 1929-1938. Output growth in the afterwar period was high in both countries. However, during the 1950s, rates were much higher in the Netherlands (between 1950 and 1960 5.9 per cent, as against Belgium 3.0 per cent). In the period 1973-1987 Belgian performance was obviously better than the Dutch, output growth being 0.7 percent points higher.

Looking at employment we find for Belgium a zero growth rate for the total period. The manufacturing sector in the Netherlands showed an increase of 1.2 percent per year on average. In both countries most of the employment growth took place in the first half of the period studied, apart from the already mentioned bad performance of Belgium in the 1930s. Between 1938 and 1950 we find for the Netherlands a rather idiosynchratic development of very high growth rates of employment accompanied by a more modest growth rate of value added. Although this development may be explained by war driven factors like obsolescence of machinery and destruction of the capital stock, we believe that the magnitude of the increase also calls for other explanations such as changing relative factor prices. In both countries the rate of employment growth in the 'golden age' between 1950 and 1973 was a mere 0.7 per cent annually. After 1973 employment in manufacturing was reduced in both countries. In fact, in the Netherlands manufacturing employment peaked in 1965, after which a decline set in until 1984. Since then employment increased again. Total labour input, however, declined further because of a rapid decline in annual working hours per person. Employment in Belgium remained high during the 1960s and the early 1970s and declined very rapidly after 1974. Compared with the Netherlands there is a time-lag in the decline of manufacturing employment of about ten years.

4. Structural changes in the economies of Belgium and the Netherlands

In section 1 it was suggested in the literature mentioned that the retardation in structural change might be an explanation for Belgiums relatively poor productivity performance during the 1930s and the 1950s. In the Netherlands performance was obviously better, although the setback during and shortly after the war had been relatively large. This puts forward the question whether structural change can explain for the differences in productivity growth between Belgium and the Netherlands. In table 5 sectoral shares of employment are given for both countries.

Table 5. Sectoral Shares of Employment in Belgium (1937, 1960 and 1987) and the Netherlands (1938, 1960, 1987) for the whole economy, in percentages

	1937	1938	1960		1987	
	Belg.	Neth.	Belg.	Neth.	Belg.	Neth.
Agriculture	15.4	20.2	8.2	10.7	2.8	5.2
Industry	42.9	32.3	44.1	42.3	27.8	25.9
Services	41.7	47.5	47.7	47.0	69.4	68.9

Note: Industry including mining, construction and utilities
Source: De Jong and Soete (1997)

In both economies shifts in employment shares were considerable during the half century between 1937 and 1987. Employment in agriculture declined rapidly and employment in the services sector increased to 69 per cent of total employment.
In contrast to Belgium, the services sector in the Netherlands has always been the largest sector in the economy. But between 1938 and 1960 its relative share declined somewhat. Employment in industry rose quickly, whereas in Belgium it remained stable. As relative productivity in the services sector is generally lower than in industry, the shift of employment into the secondary sector in the Netherlands may be the explanation for the better overall productivity performance of the Dutch economy in the 1950s (See f.i. Cassiers et al., 1996, p.175) From 1960 onward the broad sectoral employment structures of both countries showed approximately the same development.
Table 6 presents employment shares for manufacturing.

Table 6. Sectoral Shares of Employment in Manufacturing in Belgium (1937, 1960 and 1987) and the Netherlands (1938, 1960, 1987) in percentages

	1937	1938	1960		1987	
	Belg.	Neth.	Belg.	Neth.	Belg.	Neth.
Food/Bev./Tob.	13.2	23.7	14.6	15.5	13.7	17.0
Text./Cloth.	33.7	27.2	23.8	19.6	13.4	5.8
Wood/Furniture	9.3	5.8	5.9	5.7	5.4	4.2
Paper/Printing	4.4	7.6	5.1	7.5	7.2	11.6
Chem./Petr./Rubb.	6.2	4.0	6.6	7.7	12.6	14.0
Build.Materials	6.1	4.1	5.6	4.4	5.2	3.5
Metal Products	23.6	26.3	35.0	37.2	40.9	42.3
Miscell.	3.5	1.3	3.4	2.4	1.7	1.6

Source: De Jong and Soete (1997)

Between 1937/38 and 1987 large changes occurred in the industrial structure of both countries. In the period 1937/38-1960 employment growth in Belgium was strong in metal products (61 per cent) and paper and printing (26 per cent). But in the 'traditional industries' like wearing apparel and leather- and shoemaking employment declined by 34 per cent and 31 per cent respectively. In contrast, growth in manufacturing in the Netherlands was characterised by increasing employment in all major groups. In chemicals (231 per cent) and metal products (143 per cent) growth was exceptionally rapid. However, employment growth was not only concentrated in 'new' industries. Even industries like textiles and leatherworking experienced an increase in employment, although their relative shares decreased.

Between 1960 and 1987 total employment in manufacturing declined in Belgium by 35 per cent and by 23 per cent in the Netherlands. In Belgium only the chemical industry showed a slight increase in employment. In the Netherlands paper and printing and chemicals witnessed increasing employment. The loss of jobs in the 'traditional' industries, however, was much larger than in Belgium. Textiles, wearing apparel and leather and shoes together accounted in 1938 and 1960 for respectively 27.2 per cent and 19.6 per cent of manufacturing employment. In 1987 it was less than 6 per cent as against Belgium, where it was still 13 per cent.

The share of the combined metal and engineering sector in manufacturing employment has increased in both countries. In 1937/1938 metallurgy, metalworking and engineering accounted for about one quarter of all jobs within manufacturing. In 1960 it had risen to 35 per cent, and in 1987 the share was more than 40 per cent. In Belgium metallurgy has traditionally played a large role, originating from the first half of the nineteenth century. Before the Second World War employment in metallurgy (including non-ferro) was about 65,500 workers, roughly one quarter of total employment in the metal trades. In 1987 employment was at 52,000, still one sixth of total employment within metal production. In the Netherlands the size of the metallurgy branche has always been smaller than in Belgium. At the end of the 1930s employment in metallurgy was at about 5,000 workers. In 1987 employment was sixfold at 30,000, approximately 7 per cent of total employment within metal products. During the 1960s employment in the Belgian transportation-equipment sector rose fast, mainly because of the rise of automobile-assemblage. In 1987 it constituted the largest single branch in manufacturing with 47,500 workers. In contrast, the transportation-equipment sector in the Netherlands became less important due to the downturn in shipbuilding. Employment in this branch declined from 54,000 workers around 1960 to less than 18,000 in 1987. Now electrical engineering alone covers 42 per cent of total employment in the Dutch metalsector (De Jong and Soete, 1987).

5. Labour costs and unit labour costs in Belgium and the Netherlands

Comparative estimates of productivity can be put into a better perspective if we look at the development of labour costs, which cover the largest part of value added. One of the crucial questions involved is the way in which productivity and wages have moved in time. According to the classical view different levels of labour costs in two countries can influence comparative labour productivity. Comparatively low labour costs increase profits in the low wage country. Reinvestment of profits leads to higher capital accumulation and higher productivity in the future. High labour costs will discourage entrepreneurs to reinvest, leading to an overall stagnation of productivity in the high wage country. However, if we take a sectoral point of view the outcome can become somewhat different. In this approach we assume that inter-industry differences in wage levels and productivity determine profit levels and competitiveness

in the specific industries. When wage levels are high, firms and/or industries with relatively low productivity levels will be forced out of business, which will lead to an increase in labour productivity for total manufacturing. Note that in both approaches the effect of higher wages on aggregate productivity are different.

How did wage levels develop in the two countries? For Belgium it is clear that before the war real wages were lower than after the war. As we have seen this was not the case with productivity. According to an index of real wages reported by Cassiers and Solar (1990, p.448, 449), the real wage level in 1950 was 7 per cent above the level in 1938. In the Netherlands however, real wages declined from 1938 to 1950 with 4 per cent, or even 30 per cent if we apply an index of wholesale prices instead of the consumer price index. The shift in comparative wages levels between Belgium and the Netherlands was reinforced by a devaluation of the Dutch guilder of 20 per cent relative to the Belgian franc in 1949.
(See also Dupriez (1951) and Van Zanden (1988, p. 476)). This general pattern is not based exclusively on manufacturing. Therefore, we present in the next table summarizing aggregates for comparative labour costs (wages and social charges), productivity and unit labour costs which have been calculated for the three benchmark years for manufacturing only.

Table 7. Comparative Labour Costs, Productivity Levels and Unit Labour Costs in Manufacturing in 1937, 1960 and 1987 in Belgium and the Netherlands (Neth =100)

	Labour costs	Labour prody	Unit labour c.
1937	63.7	95.5	66.7
1960	123.2	92.5	133.2
1987	95.8	94.0	101.9

Source: De Jong and Soete (1997) and table 1

What we can infer from this table is that although labour productivity ratios have been rather stable in the comparison-years, labour costs differed widely, causing large changes in unit labour costs. In 1937 wages per worker were invariably higher in the Dutch manufacturing branches compared with the Belgian. The average wage in industry (including social charges) was Dfl. 1,050 whereas the Belgian level of labour costs was Dfl. 672 (converted at the official exchange rate). In 1960 Dutch wages in manufacturing were on average Dfl. 5,743, whilst the Belgian wage level was at Dfl. 7,073. If we take into consideration the productivity levels we see that the benchmark years 1937 and 1960 show most extreme values of unit labour costs. In the Netherlands there were very high unit labour costs in 1937, but relatively low unit labour costs in 1960. After 1960 wages levels converged very rapidly, due to the revaluation of the Dutch guilder in 1961, quickly followed by an extraordinary increase in wages in the Netherlands (Van Rijckeghem, 1980 p. 585). In 1987 unit labour costs were practically at par.

Another important difference in the pattern of wage formation between both countries is the degree of wage dispersion. Before the war Dutch inter-industry variations in wage levels were larger than in Belgium. But after the war wage dispersion between the Belgian industries became much higher compared with the Dutch inter-industry variation. For 1960 and 1987 we calculated coefficients of variation of respectively 0.25 and 0.30 for the Belgian industries. Generally wages are high in high productivity sectors (chemicals and metallurgy) and low in low productivity sectors (textiles, wood products, leather and shoes). In fact wage differentials and productivity differentials are similar. For the Netherlands we find cross-industry productivity differentials which are more or less the same as the Belgian pattern. However, variation in wages across industries is much lower than in Belgium. Coefficients of variation for 1960 and 1987 are only 0.13 and 0.19 (De Jong and Soete, 1997).

The questions we will try to answer in the remaining part of this section are: First, how can we explain for the large change in comparative wage levels during the 1940s and 1950s and for the persistent difference in cross-industry wage disparity between Belgium and the Netherlands thereafter? Second, can we identify a causal relationship between the level and structure of wages on the one hand and productivity on the other within the manufacturing sectors of both countries?

In our view changes in the wage patterns in both countries reflect differences in industrial relations and bargaining systems. The Belgian situation after the Second World War is characterised by an absence of wage coordination at a central level. After 1948 the government withdrew its control over wages, which were negociated at three levels: the firm, the sector or industry and the nation (Dancet, 1988, p.99). Wage demands were related to productivity increases (Cassiers and Solar, 1990, 445), but in practice were linked to profit levels. The fact that wage norms were set at the level of industries may have fostered higher wage differentials between workers in different branches.

In the Netherlands a more centralistic approach was adopted. After 1945 the Dutch policy on wages and income was directed at keeping down the general wage level to improve competitiveness of Dutch exports. This policy was backed by unions and employers' organisations alike. A second important corollary was the compression of wages between the different industries ('equal pay for equal work'), to ensure that productivity gains were not passed directly to labour (Van Ark, De Haan, De Jong 1996). In the Netherlands wage compression prevented average wages from following productivity differentials, passing the gains to (foreign) consumers and the owners of capital, who were expected to re-invest profits.

The differences in wage levels between Belgium and the Netherlands can explain why

productivity growth during the 1950s diverged. Belgium started off as a high-cost producer. Profits in the manufacturing sector were lower than in the Netherlands, which may have hampered (temporarily) reallocation of resources into new production processes. In the Netherlands wages were kept low across the board, creating above-normal profits which were re-invested in all sectors within manufacturing. Even in traditional sectors like textiles, clothing and shipbuilding employment increased. Although the general opinion is that most of the investments were of a capital broadening nature, they nevertheless increased productivity rapidly through vintage effects. This process was reinforced by the rapid growth of the labour force (Van Zanden and Griffiths, 1989).

To answer the question how Belgian manufacturing could cope with such high labour costs we have to approach manufacturing performance from a more disaggregated level. Table 8 shows a breakdown of unit labour costs per major group. In general we find high comparative labour costs in the capital intensive industries like paper, chemicals, building materials and metalworking. However, comparative unit labour costs in the labour intensive industries like foodstuffs and textiles were not as high as in the other branches. So in industries where labour costs were an important factor in international competitiveness differences between Belgium and the Netherlands in unit labour costs were not as large as in the capital intensive industries. The one exception being leather- and shoemaking, which performed very badly.

Table 8. Unit Labour Costs in 1937, 1960 and 1987 in Major Groups in Manufacturing, Belgium and the Netherlands (Neth. =100)

Major group	Unit labour 1937	Unit labour 1960	Unit labour 1987
Foodstuffs	65	103	90
Text./Cloth.	60	106	107
Leather/shoes	59	136	120
Wood products	n.a.	112	76
Paper & pr.	78	145	115
Chemicals	70	140	119
Building mat.	79	126	94
Metal	68	128	95
Tot.Manuf.	66.7	133.2	101.9

Source: De Jong and Soete (1997)

The pattern may also explain why the relative variance in comparative productivity levels between Belgium and the Netherlands has not declined further after 1960 (see section 1). Low comparative wage levels in Belgian industries like textiles and food products allowed marginal producers to remain in business, lowering the overall comparative productivity within these sectors. Table 1 has shown that Belgian productivity levels in textiles and food show a sustained decline compared with the Dutch sectors.

From 1960 onward labour scarcity increased and it became increasingly difficult to maintain a cooperative equilibrium between labour and capital-owners in the Netherlands. Wage levels were pushed up. During the 1960s and 1970s centralised government interference with wages weakened. Instead a system of 'wage leadership' evolved, characterised by the setting of wage levels in high productivity industries which were taken over by low productivity industries. Thus centralisation of wage formation was not given up altogether. During the 1980s central agreements between unions and employers organisations on wages and on labour time reductions in effect held down wage differentials.

What were the effects on manufacturing performance? With the benefit of hindsight, the conclusion is justified, that the Dutch process of industrialisation during the 1950s was atypical. Wage norms were set a low level. The effects of the wages policy on labour intensive industries was such that substitution of labour for capital was delayed as was the application of economies of scale. The collapse of the wages policy brought about an overall rise in wages in the beginning of 1960s. Through the system of wage leadership wage norms were set at a much higher level. From 1965 onward foreign competition gradually forced the low productivity industries to restructure, resulting in a shake-out of labour which simultaneously increased productivity growth. Seen from this point of view, the 'benign' results of the policy of low wages (that is: high investment rates) during the 1950s, at the same time had delayed an inevitable process of restructuring into which the Dutch manufacturing sector was forced in the 1960s. After 1974 productivity growth in manufacturing stagnated and increased at a much slower rate thereafter.

In Belgium the system of wage/labour relations gradually took a more centralised form in which the government set limits to wage increases. Moreover, the economic crisis of 1970s and the early 1980s forced the government to initiate reconversion plans for traditional industries like textiles, steel, glass and shipbuilding. A direct link was introduced between subsidies and wage cuts, general wage formation becoming a matter of government concern in these industries. In general, however, the link between real wage increases and productivity increases prevailed in wage negociations in many sectors (Dancet, 1988, p. 110 and 111). This situation continued large variations in wage levels between industries.

Productivity levels of Belgian manufacturing fell behind Dutch levels in the 1960s and 1970s. We repeat that Dutch employment levels already had fallen from 1965 onward, mostly concentrated in sectors like textiles, clothing and shipbuilding. Productivity performance in Belgium increased at a rate comparable to the rate it had experienced in the 1950s, slowing down in the early seventies. The fact that Belgium trailed behind in this development of employment contraction can be explained by the relatively low wages in the low productivity sectors. During the 1960s relatively low labour costs in the 'traditional' sectors inhibited productivity growth at the same rate as in the Netherlands. But from 1975 onward the low productivity sectors went through a similar process as the Dutch had experienced before. During the 1970s Belgian industrial value added increased more rapidly than the Dutch, whereas employment levels decreased faster. Investments in growth sectors were not able to absorb the same amount of employment that was lost in the stagnating sectors and were capital intensive anyway, directed at saving labour (Cassiers et al., 1996, Van Ark et al, 1996). During the second half of the 1970s and in the 1980s the rate of productivity growth was higher than in the Netherlands, leading to a tendency of productivity convergence in the manufacturing sectors of the two countries.

References

Ark, B. van (1993), International Comparisons of Output and Productivity. Manufacturing Productivity Performance of Ten Countries from 1950 to 1990, Groningen Growth and Development Centre Monograph Series, no.1, Groningen.

Ark, B . van, and H.J. de Jong (1996), Accounting for Economic Growth in the Netherlands since 1913, Research Memorandum GD-26, Groningen Growth and Development Centre, Groningen.

Ark, B. van, J. de Haan en H.J. de Jong (1996), 'Characteristics of Economic Growth in the Netherlands during the postwar period', in N. Crafts and G. Toniolo (eds.) Economic Growth in Europe since 1945, CEPR, Cambridge University Press, pp. 290-328.

Barro, R.J. and X. Sala-i-Martin (1991), 'Convergence across States and Regions', Brookings Papers on Economic Activity, 107-182.

Blomme, J. (1986), 'Changes in Labour Productivity and their Consequences for the Per Capita Income Levels in Belgium and the Netherlands, 1880-1980', in P. O'Brien (ed.) International Productivity Comparisons and Problems of Measurement, 1750-1939, 9th Congress of the International Economic History Association, Berne.

Broadberry, S.N. (1993), "Manufacturing and the Convergence Hypothesis: What the Long-Run Data Show", The Journal of Economic History, vol. 53 no.4 December, pp. 772-795.

Cassiers, I. (1989), Croissance, crise et régulation en économie ouverte. La Belgique entre les deux guerres, Bruxelles.

Cassiers, I. and P. Solar (1990), 'Wages and Productivity in Belgium, 1910-1960', in Oxford Bulletin of Economics and Statistics, 52, 4, pp. 437-449.

Cassiers, I. , Ph. de Villé and P. Solar (1996), 'Economic growth in postwar Belgium', in N. Crafts and G. Toniolo (eds.) Economic Growth in Europe since 1945, CEPR, Cambridge University Press, pp. 173-209.

CBS, Productiestatistieken van de Nederlandse nijverheid.

Coppieters, B. (1985), Schatting van de koopkracht en de loonevolutie van arbeiders en bedienden in de privésector 1906-1945, op basis van de statistieken betreffende de arbeidsongevallenverzekering, Centrum voor Politicologie, Werkdocument no.4, Brussel.

Crafts, N.F.R. (1992), 'Productivity growth reconsidered', Economic Policy 15, pp. 388-426.

Dancet, G. (1988), 'From a workable social compromise to conflict: the case of Belgium', in R. Boyer (ed.), The Search for Labour Market Flexibility, Oxford: Clarendon.

Dupriez, L.H. (1951), 'Pourquoi de hauts niveaux de remunération en Belgique', Comptes-rendus des travaux de la Société Royale d'Economie Politique de Belgique, no. 201, pp. 5-23.

Eurostat (1989), Labour Force Survey. Results 1987.

Hogg, R.L. (1986), Structural rigidities and policy inertia in inter-war Belgium, AWLsK nr. 118, Brussel.

Jong, H.J. de (1993), "Measuring real output and productivity in Dutch manufacturing 1921-1960", Economic and Social History in the Netherlands, vol. 5, pp. 213-242.

Jong, H.J. de (1999), De Nederlandse industrie 1913-1965. Een vergelijkende analyse op basis van de productiestatistieken. Amsterdam; NEHA.

Jong, H.J. de, and R. Albers (1994), 'Industrial Output and Labour Productivity in the Netherlands, 1913-1929: Some Neglected Issues', Research Memorandum No. GD-13, Groningen Growth and Development Centre, Groningen.

Jong, H.J. de, and T. Soete (1997), 'Comparative productivity and structural change in Belgian and Dutch manufacturing, 1937-1987', Research Memorandum No. GD-36, Groningen Growth and Development Centre, Groningen.

Maddison, A and B. van Ark (1994), The International Comparison of Real Product and Productivity, Research Memorandum, No. GD-6, Groningen Growth and Development Centre, Groningen.

Ministerie van Economische Zaken, Economische en Sociale Telling van 27 februari 1937, Brussel.

Lamfalussy, A. (1961) Investment and Growth in Mature Economies, London.

Paige, D and G. Bombach (1959), A Comparison of National Output and Productivity, OEEC, Paris.

Peeters, S. et.al. (1986), Reconstruction of the Belgian national income 1920-1939. Methodology and results. CES Discussion paper 86.01, Workshop on Quantitative Economic History, Leuven.

Rijksverzekeringsbank, Ongevallenstatistiek.

Rostas, L. (1948), Comparative Productivity in British and American Industry, NIESR Occasional Papers XIII, Cambridge.

Soete, A. (1994), The Evolution of the Competitiveness of the Belgian Manufacturing Industry in the Long Run, 1880-1990, Paper presented at the Economics Department KUL, Leuven.

Van Rijckeghem, W. (1982), 'Benelux', in A. Boltho (ed.), The European Economy: Growth and Crisis, Oxford: Oxford University Press, pp. 581-609.

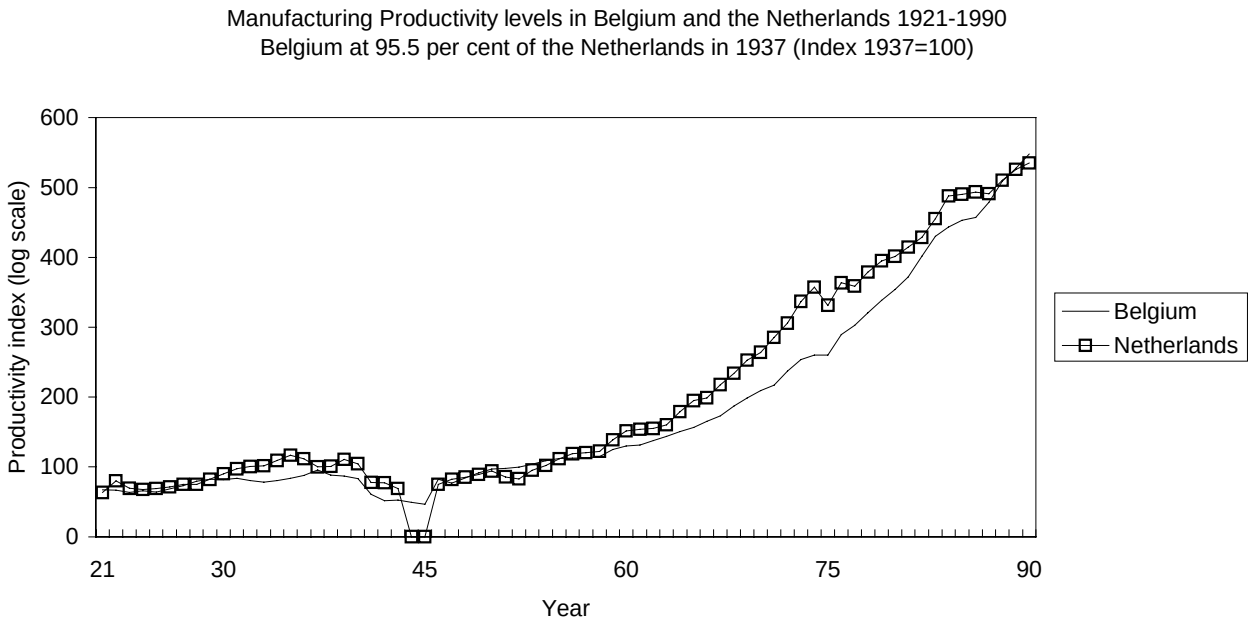
Vandermotten, C. (1980), 'Tendences longues de l'évolution de la production, de l'emploi et de la productivité industriels en Belgique: 1840-1978', Cahiers économiques de Bruxelles, no. 86, pp. 261-301.

Vries, J. de (1976), 'Benelux 1920-1970', C.M. Cipolla (ed.) The Fontana Economic History of Europe 6 (1), pp. 1-71.

Zanden, J.L. van, 'Geleide loonpolitiek en de internationale concurrentiepositie van Nederland, 1948-1962', Maandschrift Economie 52, pp.464-477.

Zanden, J.L., and R.T. Griffiths (1989), Economische geschiedenis van Nederland in de 20e eeuw, Aula, Utrecht.

Graph 1


Manufacturing Productivity levels in Belgium and the Netherlands 1921-1990
Belgium at 95.5 per cent of the Netherlands in 1937 (Index 1937=100)
Productivity index (log scale)
600
500
400
300
200
100
0
21
30
45
60
75
90
Year
Belgium
Netherlands